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A SEARCH FOR BIOGENIC TRACE GASES IN THE
ATMOSPHERE OF MARS

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The detection of certain trace gases in the atmosphere of Mars may serve as a possible indicator of microbial life on the surface of Mars. Candidate biogenic gases include methane (CH₄), ammonia (NH₃), nitrous oxide (N₂O), and several reduced sulfur species. Chemical thermodynamic equilibrium and photochemical calculations preclude the presence of these gases in any measurable concentrations in the atmosphere of Mars in the absence of biogenic production. A search for these gases utilizing either high resolution (spectral and spatial) spectroscopy from a Mars orbiter, such as the Observer, and/or *in situ* measurements from a Mars lander or rover, is proposed.